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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,067	02/28/2002	Benjamin P. Hoag	83659AEK	1424

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EXAMINER	
GARRETT, DAWN L	

ART UNIT	PAPER NUMBER
1774	

DATE MAILED: 01/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/086,067	HOAG ET AL.	
	Examiner	Art Unit	
	Dawn Garrett	1774	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. This Office action is responsive to the amendment sent December 1, 2003 (received December 4, 2003). Claims 12, 13, 18, and 19 were amended. Claims 1-26 are pending.

2. The objections to claims 12, 13, 18, and 19 set forth in paper no. 3 (mailed July 3, 2003) are withdrawn due to the amendments to these claims.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. The rejection of claims 1-11, 13-23, 25, and 26 under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 5,972,247) in view of "New Laser Dyes", Applied Physics (Berlin), volume 3, no. 1, pages 81-88, (1974) is maintained. Instant claim 1 requires an organic electroluminescent device comprising a light-emitting layer containing a host and a dopant where the dopant comprises a boron compounds containing a bis(azinyl)methane boron complex group. Shi '721 teaches an organic electroluminescent device comprising an anode, a cathode and an organic electroluminescent element between the electrodes (see abstract). Shi teaches light-emitting layers commonly comprise host material doped with a guest material. The host material is commonly electron transport material such as 8-hydroxyquinoline aluminum complex [these materials are chelates of oxine and an example of such a compound is Aluminum trisoxine, a.k.a. tris(8-quinolinol)aluminum (see col. 50, lines 2-3 and 39)] and the dopant is usually chosen from highly fluorescent dyes (see col. 1, lines 29-40) per

instant claims 1, 8, 9, and 11. In addition, Shi '721 teaches a light-emitting layer (EML) comprising a host material such as 9, 10-di-(2-naphthyl) anthracene (see col. 6, lines53-62) derivatives doped with fluorescent dye (see col. 47, lines 59-62) per instant claims 1, 8, and 10. Shi '721 fails to teach specific fluorescent dyes comprising a bis(azinyl)methane boron complex group as required by independent instant claim 1. Applied Physics teaches, in analogous art, a fluorescent dye with strong intensity, which is identical to instant claim 23 compound "Inv-10" (see page 88, compound V 12) per instant claims 4-7, 14-20, and 23. It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed a light emitting layer comprising either Alq3 or anthracene derivative host material and have selected a dopant according to "Inv-10", because Shi et al. teaches a light emitting layer comprising an Alq3 or anthracene derivative host material doped with a fluorescent dye and Applied Physics teaches "Inv-10" boron fluorescent dye is a known fluorescent dye with strong intensity. Per instant claims 2, 3, 21, and 22, Shi '721 teaches doping a light emitting layer with 1.0% fluorescent dye (see col. 56, lines 22-27). Shi '721 teaches a light-emitting device with a doped light emitting layer provides highly efficient electroluminescence(see col. 1, lines 43-44). Accordingly, per instant claim 13, it would have been obvious to one of ordinary skill in the art at the time of the invention to have expected a greater luminescence with a doped layer than an undoped layer absent evidence otherwise, because Shi '721 teaches the high efficiency of luminescence of a doped layer. Shi '721 further teaches EL elements may be used for the production of a full color EL display panel (see col. 2, lines 66-67) per instant claim 25. The examples

of Shi '721 show the EL devices are subjected to electric current to emit light per instant claim 26 (see col. 52, line 52 through col. 58, line 46).

5. The rejection of claims 1-11, 13-15, and 19-26 under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 5,972,247) in view of "Fluorescent Tricyclic beta-Azavinamidine-BF_2 Complexes", Sathyamoorthi et al., Heteroatom Chemistry, Vol. 4, No. 6, pages 603-608, 1993 is maintained. Instant claim 1 requires an organic electroluminescent device comprising a light-emitting layer containing a host and a dopant where the dopant comprises a boron compounds containing a bis(azinyl)methane boron complex group. Shi '721 teaches an organic electroluminescent device comprising an anode, a cathode and an organic electroluminescent element between the electrodes (see abstract). Shi teaches light-emitting layers commonly comprise host material doped with a guest material. The host material is commonly electron transport material such as 8-hydroxyquinoline aluminum complex [these materials are chelates of oxine and an example of such a compound is Aluminum trisoxine, a.k.a. tris(8-quinolinol)aluminum or "Alq3" (see col. 50, lines 2-3 and 39)] and the dopant is usually chosen from highly fluorescent dyes (see col. 1, lines 29-40) per instant claims 1, 8, 9, and 11. In addition Shi '721 teaches a light-emitting layer (EML) comprising a host material such as 9, 10-di-(2-naphthyl) anthracene (see col. 6, lines 53-62) derivatives doped with fluorescent dye (see col. 47, lines 59-62) per instant claims 1, 8, and 10. Shi '721 fails to teach specific fluorescent dyes comprising a bis(azinyl)methane boron complex group as required by independent instant claim 1. Heteroatom Chemistry teaches, in analogous art, a fluorescent dye "compound 3" (see

page 604, top right) with a maximum peak wavelength of 468 nm, which is identical to instant claims 23 and 24 compound "Inv-5" per instant claims 4-7, 14-20, and 24. It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed a light emitting layer comprising either Alq3 or anthracene derivative host material and have selected a dopant according to "Inv-5", because Shi et al. teaches a light emitting layer comprising an Alq3 or anthracene derivative host material doped with a fluorescent dye and Heteroatom Chemistry teaches "Inv-5" boron fluorescent dye is a known, intense fluorescent dye for fluorescent applications (see page 603, topmost paragraph right column). Per instant claims 2, 3, 21, and 22, Shi '721 teaches doping a light emitting layer with 1.0% fluorescent dye (see col. 56, lines 22-27). Shi '721 teaches a light-emitting device with a doped light emitting layer provides highly efficient electroluminescence (see col. 1, lines 43-44). Accordingly, per instant claim 13, it would have been obvious to one of ordinary skill in the art at the time of the invention to have expected a greater luminescence with a doped layer than an undoped layer absent evidence otherwise, because Shi '721 teaches the high efficiency of luminescence of a doped layer. Shi '721 further teaches EL elements may be used for the production of a full color EL display panel (see col. 2, lines 66-67) per instant claim 25. The examples of Shi '721 show the EL devices are subjected to electric current to emit light per instant claim 26 (see col. 52, line 52 through col. 58, line 46).

6. The rejection of claim 12 under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 5,972,247) in view of "Fluorescent Tricyclic beta-Azavinamidine-BF_2 Complexes", Sathyamoorthi et al., Heteroatom Chemistry, Vol. 4, No. 6, pages 603-608,

1993 in further view of Shirasaki (US 5,834,894) is maintained. Shi '721 and the Heteroatom Chemistry article are relied upon as set forth above for the rejection of claim 12. Shi '721 renders obvious a light emitting layer comprising Alq3 as a host material and teaches the light emitting layer is doped with a fluorescent dye. Heteroatom Chemistry teaches instant Inv-5 (compound 3 in the reference) as a fluorescent dopant with a maximum wavelength at 468 nm (which is in the blue-green region of the visible spectrum as shown in figure 3 of attached reference Patterns in Nature: Light and Optics, "Color and Light", seven pages, last modified 26 December 1999, Department of Physics and Astronomy, Arizona State University, URL: http://acept.asu.edu/PiN/rdg/color/color.shtml). Shi and Heteroatom Chemistry fail to teach specifically the color emitted from the light emitting layer. Shirasaki teaches in analogous art, in an EL device comprising Alq3 in the emitting layer, Alq3 itself emits green color even if a blue dopant is doped into the Alq3 layer (see col. 6, lines 45-48). Accordingly, it would have been obvious to one of ordinary skill in the art to have expected green light emission from the light emitting device comprising Alq3 and a boron fluorescent dopant according to "Inv-5", because Shirasaki teaches a light emitting layer comprising Alq3 emits green light.

Response to Arguments

7. Applicant's arguments filed December 1, 2003 have been fully considered but they are not persuasive. With regard to the comments based on the objections to claims 12, 13, 18, and 19, the objections have been withdrawn in light of the amendment.

8. With regard to the rejection over Shi et al. (US 5,5972,247) in view of "New Laser Dyes ", Applied Physics (Berlin), vol. 3, no. 1, pages 81-88, (1974), applicant states that although the Shi reference "prefers highly fluorescent materials, this teaching relates to the emission as it exists in the solid state OLED device. Shi does not teach that all materials that fluoresce under any conditions will do so in the solid state arrangement of an OLED." Applicant states "The Applied Physics article is directed to materials that are useful as laser dyes which are not related to and readily distinguished from solid state dopants for OLED devices....There is no rationale that predicts the suitability for fluorescing in solid state from laser fluorescence in solution and obvious to try is not a valid basis for rejecting a claim." In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the examiner submits Shi clearly teaches the combination of hosts and fluorescent dopants. The Applied Physics article clearly teaches highly fluorescent compounds per the fluorescent dopants. It would be obvious to use the Applied Physics compounds in the Shi device, because the Shi device teaches the use of fluorescent compounds. It is not necessary that the Applied Physics article, as the secondary reference, discuss the use of the fluorescent compounds in an OLED device as the reference is relied upon for

the teaching of fluorescent compounds. Applicant has not provided any clear documentation that the Applied Physics compounds are not fluorescent compounds and are not suitable fluorescent compounds for use in the Shi device. Per M.P.E.P. § 2145, the arguments of counsel cannot take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); *In re Geiseler*, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997). Furthermore, the examiner again notes that the Applied Physics article teaches a compound identical to instant "Inv-10". Identical compounds exhibit similar properties.

9. With regard to the rejection over Shi et al. (US 5,5972,247) in view of Heteroatom Chemistry, vol. 4, no. 6, pp. 603-608, 1993, applicant has not provided a persuasive argument that Heteroatom Chemistry article does not teach a fluorescent boron compound suitable to be used in the Shi device. The compound taught by Heteroatom Chemistry is identical to the boron compound "Inv-5" claimed by applicant. It is not seen how the Heteroatom Chemistry compound would not have exactly the same properties as the instant compound, because the compounds are identical. Applicant further claims "468 nm does not appear to be green light" according to the spectrum provided by applicant. The examiner submits the wavelength "468 nm" falls between blue and green in the visible range and accordingly, would be a blue-green light. Furthermore, because the Heteroatom Chemistry compound and the instant compound are the same, they are expected to have the same properties, which includes color.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (571)272-1523. The examiner can normally be reached Monday through Friday. Please allow the examiner twenty-four hours to return your call.

If reasonable attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached at (571) 272-1526. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

D.G.
January 20, 2004